

IN THE CLAIMS:

- 1 1. (Currently Amended) A method of proving membership in a nested group, wherein a
2 presenter of credentials that requests one or more resources to which access is so controlled
3 by a recipient of credentials [[so]] as to make them available to members of the nested group
4 presents to the recipient of credentials one or more chains of group credentials that prove
5 the presenter's membership in the nested group.
- 1 2. (Original) The method of claim 1, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.
- 1 3. (Original) The method of claim 2, wherein said proofs of group membership comprise
2 one or more group membership certificates.
- 1 4. (Original) The method of claim 2, wherein said proofs of group membership comprise
2 one or more group membership lists.
- 1 5. (Original) The method of claim 1, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.
- 1 6. (Original) The method of claim 5, wherein said proofs of group non-membership
2 comprise one or more group non-membership certificates.
- 1 7. (Original) The method of claim 5, wherein said proofs of group non-membership
2 comprise one or more group membership lists.
- 1 8. (Original) The method of claim 1, wherein said recipient is a resource server.
- 1 9. (Original) The method of claim 1, wherein said recipient is an on-line group server.
- 1 10. (Original) The method of claim 1, wherein said recipient is an on-line revocation server.
- 1 11. (Original) The method of claim 1, wherein said recipient is a client.

- 1 12. (Currently Amended) A method of proving non-membership in a nested group,
2 wherein a presenter of credentials that requests one or more resources to which access is so
3 controlled by a recipient of credentials [[so]] as to make them available to non-members of
4 the nested group presents to the recipient of credentials one or more chains of group
5 credentials that prove the presenter's non-membership in the nested group.
- 1 13. (Original) The method of claim 12, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.
- 1 14. (Original) The method of claim 13, wherein said proofs of group membership comprise
2 one or more group membership certificates.
- 1 15. (Original) The method of claim 13, wherein said proofs of group membership comprise
2 one or more group membership lists.
- 1 16. (Original) The method of claim 12, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.
- 1 17. (Original) The method of claim 16, wherein said proofs of group non-membership
2 comprise one or more group non-membership certificates.
- 1 18. (Original) The method of claim 16, wherein said proofs of group non-membership
2 comprise one or more group membership lists.
- 1 19. (Original) The method of claim 12, wherein said recipient is a resource server.
- 1 20. (Original) The method of claim 12, wherein said recipient is an on-line group server.
- 1 21. (Original) The method of claim 12, wherein said recipient is an on-line revocation
2 server.
- 1 22. (Original) The method of claim 12, wherein said recipient is a client.

1 23. (Currently Amended) A computer system wherein a presenter of credentials that
2 requests one or more resources to which access is so controlled by a recipient of credentials
3 [[so]] as to make them available to members of a nested group presents to the recipient of
4 credentials one or more chains of group credentials to prove the presenter's membership
5 in the nested group.

1 24. (Original) The system of claim 23, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.

1 25. (Original) The system of claim 24, wherein said proofs of group membership comprise
2 one or more group membership certificates.

1 26. (Original) The system of claim 24, wherein said proofs of group membership comprise
2 one or more group membership lists.

1 27. (Original) The system of claim 23, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.

1 28. (Original) The system of claim 27, wherein said proofs of group non-membership
2 comprise one or more group non-membership certificates.

1 29. (Original) The system of claim 27, wherein said proofs of group non-membership
2 comprise one or more group membership lists.

1 30 (Original) The system of claim 23, wherein said recipient is a resource server.

1 31 (Original) The system of claim 23, wherein said recipient is an online group server.

1 32. (Original) The system of claim 23, wherein said recipient is an on-line revocation
2 server.

1 33. (Original) The system of claim 23, wherein said recipient is a client.

1 34. (Currently Amended) A computer system wherein a presenter of credentials that
2 requests one or more resources to which access is so controlled by a recipient of credentials
3 [[so]] as to make them available to non-members of a nested group presents to the recipient
4 of credentials one or more chains of group credentials to prove the presenter's non-
5 membership in the nested group.

1 35. (Original) The system of claim 34, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.

1 36. (Original) The system of claim 35, wherein said proofs of group membership comprise
2 one or more group membership certificates.

1 37. (Original) The system of claim 35, wherein said proofs of group membership comprise
2 one or more group membership lists.

1 38. (Original) The system of claim 34, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.

1 39. (Original) The system of claim 38, wherein said proofs of group non-membership
2 comprise one or more group non-membership certificates.

1 40. (Original) The system of claim 38, wherein said proofs of group non-membership
2 comprise one or more group membership lists.

1 41. (Original) The system of claim 34, wherein said recipient is a resource server.

1 42. (Original) The system of claim 34, wherein said recipient is an on-line group server.

1 43. (Original) The system of claim 34, wherein said recipient is an on-line revocation
2 server.

1 44. (Original) The system of claim 34, wherein said recipient is a client.

1 45. (Currently Amended) A method of requesting one or more resources from a server
2 on a computer network, in which access to said resources is so controlled by said server
3 [[so]] as to make them available to members of a nested group, the method comprising:

4 A. obtaining one or more chains of group credentials that prove membership in
5 the nested group, and

6 B. transmitting to the server a request for one or more of the one or more
7 resources, said request including the one or more chains of group credentials that prove
8 membership in the nested group.

1 46. (Original) The method of claim 45, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.

1 47. (Original) The method of claim 46, wherein said proofs of group membership comprise
2 one or more group membership certificates.

1 48. (Original) The method of claim 46, wherein said proofs of group membership comprise
2 one or more group membership lists.

1 49. (Original) The method of claim 45, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.

1 50. (Original) The method of claim 49, wherein said proofs of group non-membership
2 comprise one or more group non-membership certificates.

1 51. (Original) The method of claim 49, wherein said proofs of group non-membership
2 comprise one or more group membership lists.

1 52. (Currently Amended) A method of requesting one or more resources from a server
2 on a computer network, in which access to said resources is so controlled by said server
3 [[so]] as to make them available to non-members of a nested group, the method
4 comprising:

5 A. obtaining one or more chains of group credentials that prove non-
6 membership in the nested group, and

7 B. transmitting to the server a request for one or more of the one or more
8 resources, said request including the one or more chains of group credentials that prove
9 non-membership in the nested group.

1 53. (Original) The method of claim 52, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.

1 54. (Original) The method of claim 53, wherein said proofs of group membership comprise
2 one or more group membership certificates.

1 55. (Original) The method of claim 53, wherein said proofs of group membership comprise
2 one or more group membership lists.

1 56. (Original) The method of claim 52, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.

1 57. (Original) The method of claim 56, wherein said proofs of group non-membership
2 comprise one or more group non-membership certificates.

1 58. (Original) The method of claim 56, wherein said proofs of group non-membership
2 comprise one or more group membership lists.

1 59. (Currently Amended) A client device on a computer network, said client device
2 configured for requesting one or more resources from a server on the network, in which
3 access to said resources is so controlled by said server [[so]] as to make them available to
4 members of a nested group, said client device comprising:

5 A. means for obtaining one or more chains of group credentials that prove client
6 membership in the nested group, and

7 B. means for transmitting to the server a request for one or more of the one or
8 more resources, said request including the one or more chains of group credentials that
9 prove client membership in the nested group.

1 60. (Original) The client device of claim 59, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.

1 61. (Original) The client device of claim 60, wherein said proofs of group membership
2 comprise one or more group membership certificates.

1 62. (Original) The client device of claim 60, wherein said proofs of group membership
2 comprise one or more group membership lists.

1 63. (Original) The client device of claim 59, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.

1 64. (Original) The client device of claim 63, wherein said proofs of group nonmembership
2 comprise one or more group non-membership certificates.

1 65. (Original) The client device of claim 63, wherein said proofs of group non-
2 membership comprise one or more group membership lists.

1 66. (Currently Amended) A client device on a computer network, said client device
2 configured for requesting one or more resources from a server on the network, in which
3 access to said resources is so controlled by said server [[so]] as to make them available to
4 non-members of a nested group, said client device comprising:

5 A. means for obtaining one or more chains of group credentials that prove client
6 non-membership in the nested group, and

7 B. means for transmitting to the server a request for one or more of the one or
8 more resources, said request including the one or more chains of group credentials that
9 prove client non-membership in the nested group.

- 1 67. (Original) The client device of claim 66, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.
- 1 68. (Original) The client device of claim 67, wherein said proofs of group membership
2 comprise one or more group membership certificates.
- 1 69. (Original) The client device of claim 67, wherein said proofs of group membership
2 comprise one or more group membership lists.
- 1 70. (Original) The client device of claim 66, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.
- 1 71. (Original) The client device of claim 70, wherein said proofs of group nonmembership
2 comprise one or more group non-membership certificates.
- 1 72. (Original) The client device of claim 70, wherein said proofs of group non-
2 membership comprise one or more group membership lists.
- 1 73. (Previously Presented) A method for operating a resource server on a computer
2 network, said resource server configured to control access to one or more resources and
3 provide access thereto to members of a nested group, the method comprising:
4 A. receiving a resource-access request from a client, said request including one
5 or more chains of group credentials proving client membership in the nested group,
6 B. validating the one or more chains of group credentials, and
7 C. if the one or more chains of group credentials are determined to be valid,
8 providing the requested access to the client.
- 1 74. (Original) The method of claim 73, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.
- 1 75. (Original) The method of claim 74, wherein said proofs of group membership comprise
2 one or more group membership certificates.

1 76. (Original) The method of claim 74, wherein said proofs of group membership comprise
2 one or more group membership lists.

1 77. (Original) The method of claim 73, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.

1 78. (Original) The method of claim 77, wherein said proofs of group non-membership
2 comprise one or more group non-membership certificates.

1 79. (Original) The method of claim 77, wherein said proofs of group non-membership
2 comprise one or more group membership lists.

1 80. (Previously Presented) A method for operating a resource server on a computer
2 network, said resource server configured to control access to one or more resources and
3 provide access thereto to non-members of a nested group, the method comprising:

4 A. receiving a resource-access request from a client, said request including one
5 or more chains of group credentials proving client non-membership in the nested group,

6 B. validating the one or more chains of group credentials, and

7 C. if the one or more chains of group credentials are determined to be valid,
8 providing the requested access to the client.

1 81. (Original) The method of claim 80, wherein one of said chains of group credentials
2 comprise one or more proofs of group membership.

1 82. (Original) The method of claim 81, wherein said proofs of group membership comprise
2 one or more group membership certificates.

1 83. (Original) The method of claim 81, wherein said proofs of group membership comprise
2 one or more group membership lists.

1 84. (Original) The method of claim 80, wherein one of said chains of group credentials
2 comprise one or more proofs of group non-membership.

1 85. (Original) The method of claim 84, wherein said proofs of group non-membership
2 comprise one or more group non-membership certificates.

1 86. (Original) The method of claim 84, wherein said proofs of group non-membership
2 comprise one or more group membership lists.

1 87. (Previously Presented) A method for operating a resource server on a computer
2 network, said resource server configured to control access to one or more resources and
3 provide access thereto to members of a nested group, the method comprising:

4 A. means for receiving a resource-access request from a client, said request
5 including one or more chains of group credentials proving client membership in the
6 nested group,

7 B. means for validating the one or more chains of group credentials, and

8 C. means for providing the requested access to the client if the one or more
9 chains of group credentials are determined to be valid.

1 88. (Original) The resource server of claim 87, wherein one of said chains of group
2 credentials comprise one or more proofs of group membership.

1 89. (Original) The resource server of claim 88, wherein said proofs of group membership
2 comprise one or more group membership certificates.

1 90. (Original) The resource server of claim 88, wherein said proofs of group membership
2 comprise one or more group membership lists.

1 91. (Original) The resource server of claim 87, wherein one of said chains of group
2 credentials comprise one or more proofs of group non-membership.

1 92. (Original) The resource server of claim 91, wherein said proofs of group non-
2 membership comprise one or more group non-membership certificates.

1 93. (Original) The resource server of claim 91, wherein said proofs of group non-
2 membership comprise one or more group membership lists.

1 94. (Previously Presented) A method for operating a resource server on a computer
2 network, said resource server configured to control access to one or more resources and
3 provide access thereto to non-members of a nested group, the method comprising:

4 A. means for receiving a resource-access request from a client, said request
5 including one or more chains of group credentials proving client non-membership in the
6 nested group,

7 B. means for validating the one or more chains of group credentials, and

8 C. means for providing the requested access to the client if the one or more
9 chains of group credentials are determined to be valid.

1 95. (Original) The resource server of claim 94, wherein one of said chains of group
2 credentials comprise one or more proofs of group membership.

1 96. (Original) The resource server of claim 95, wherein said proofs of group membership
2 comprise one or more group membership certificates.

1 97. (Original) The resource server of claim 95, wherein said proofs of group membership
2 comprise one or more group membership lists.

1 98. (Original) The resource server of claim 94, wherein one of said chains of group
2 credentials comprise one or more proofs of group non-membership.

1 99. (Original) The resource server of claim 98, wherein said proofs of group non-
2 membership comprise one or more group non-membership certificates.

1 100. (Original) The resource server of claim 98, wherein said proofs of group non-
2 membership comprise one or more group membership lists.

1 101. (Currently Amended) A computer data signal embodied in a carrier wave and
2 representing a sequence of instructions that, when executed by a processor in a network
3 device requesting one or more resources from a server, in which access to said resources
4 is so controlled by said server [[so]] as to make them available to members of a nested
5 group, configures the network device to operate as a client device that:

6 A. obtains one or more chains of group credentials that prove client membership
7 in the nested group, and

8 B. transmits to the server a request for one or more of the one or more resources,
9 said request including the one or more chains of group credentials that prove membership
10 in the nested group.

1 102. (Original) The computer data signal of claim 101, wherein one of said chains of
2 group credentials comprise one or more proofs of group membership.

1 103. (Original) The computer data signal of claim 102, wherein said proofs of group
2 membership comprise one or more group membership certificates.

1 104. (Original) The computer data signal of claim 102, wherein said proofs of group
2 membership comprise one or more group membership lists.

1 105. (Original) The computer data signal of claim 101, wherein one of said chains of
2 group credentials comprise one or more proofs of group non-membership.

1 106. (Original) The computer data signal of claim 105, wherein said proofs of group non-
2 membership comprise one or more group non-membership certificates.

1 107. (Original) The computer data signal of claim 105, wherein said proofs of group
2 non-membership comprise one or more group membership lists.

1 108. (Currently Amended) A computer data signal embodied in a carrier wave and
2 representing a sequence of instructions that, when executed by a processor in a network
3 device requesting one or more resources from a server, in which access to said resources

4 is so controlled by said server [[so]] as to make them available to non-members of a
5 nested group, configures the network device to operate as a client device that:

6 A. obtains one or more chains of group credentials that prove client non-
7 membership in the nested group, and

8 B. transmits to the server a request for one or more of the one or more resources,
9 said request including the one or more chains of group credentials that prove non-
10 membership in the nested group.

1 109. (Original) The computer data signal of claim 108, wherein one of said chains of group
2 credentials comprise one or more proofs of group membership.

1 110. (Original) The computer data signal of claim 109, wherein said proofs of group
2 membership comprise one or more group membership certificates.

1 111. (Original) The computer data signal of claim 109, wherein said proofs of group
2 membership comprise one or more group membership lists.

1 112. (Original) The computer data signal of claim 108, wherein one of said chains of group
2 credentials comprise one or more proofs of group non-membership.

1 113. (Original) The computer data signal of claim 112, wherein said proofs of group non-
2 membership comprise one or more group non-membership certificates.

1 114. (Original) The computer data signal of claim 112, wherein said proofs of group
2 non-membership comprise one or more group membership lists.

1 115. (Previously Presented) A computer data signal embodied in a carrier wave and
2 representing a sequence of instructions that, when executed by a processor in a network
3 device configured to control access to one or more resources and provide access thereto
4 to members of a nested group, configures the network device to operate as a resource
5 server that:

6 A. receives a resource-access request from a client, said request including one or
7 more chains of group credentials proving client membership in the nested group,
8 B. validates the one or more chains of group credentials, and
9 C. if the one or more chains of group credentials are determined to be valid,
10 provides the requested access to the client.

1 116. (Original) The computer data signal of claim 115, wherein one of said chains of group
2 credentials comprise one or more proofs of group membership.

1 117. (Original) The computer data signal of claim 116, wherein said proofs of group
2 membership comprise one or more group membership certificates.

1 118. (Original) The computer data signal of claim 116, wherein said proofs of group
2 membership comprise one or more group membership lists.

1 119. (Original) The computer data signal of claim 115, wherein one of said chains of group
2 credentials comprise one or more proofs of group non-membership.

1 120. (Original) The computer data signal of claim 119, wherein said proofs of group non-
2 membership comprise one or more group non-membership certificates.

1 121. (Original) The computer data signal of claim 119, wherein said proofs of group
2 non-membership comprise one or more group membership lists.

1 122. (Previously Presented) A computer data signal embodied in a carrier wave and
2 representing a sequence of instructions that, when executed by a processor in a network
3 device configured to control access to one or more resources and provide access thereto
4 to non-members of a nested group, configures the network device to operate as a resource
5 server that:

6 A. receives a resource-access request from a client, said request including one or
7 more chains of group credentials proving client non-membership in the nested group,
8 B. validates the one or more chains of group credentials, and

9 C. if the one or more chains of group credentials are determined to be valid,
10 provides the requested access to the client.

1 123. (Original) The computer data signal of claim 122, wherein one of said chains of group
2 credentials comprise one or more proofs of group membership.

1 124. (Original) The computer data signal of claim 123, wherein said proofs of group
2 membership comprise one or more group membership certificates.

1 125. (Original) The computer data signal of claim 123, wherein said proofs of group
2 membership comprise one or more group membership lists.

1 126. (Original) The computer data signal of claim 122, wherein one of said chains of group
2 credentials comprise one or more proofs of group non-membership.

1 127. (Original) The computer data signal of claim 126, wherein said proofs of group non-
2 membership comprise one or more group non-membership certificates.

1 128. (Original) The computer data signal of claim 126, wherein said proofs of group
2 non-membership comprise one or more group membership lists.